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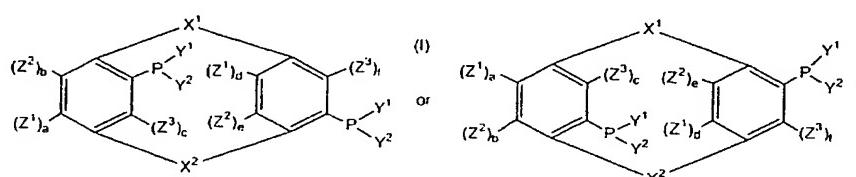
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- (57) Abstract: A substituted paracyclophane is described of formula (I) wherein X¹ and X² are linking groups comprising between 2 to 4 carbon atoms, Y¹ and Y² are selected from the group consisting of hydrogen, halide, oxygen, nitrogen, alkyl, cycloalkyl, aryl or heteroaryl, Z¹, Z² and Z³ are substituting groups that optionally contain functional groups, a, b, c, d, e and f are 0 or 1 and a + b + c + d + e + f = 1 to 6. Preferably X¹ and X² are -(C₂H₄)- and a + b + c + d + e + f = 1 or 2. The substituted paracyclophane provides transition metal catalysts that demonstrate high activity and selectivity for asymmetric reactions.

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